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A new species of the genus *Platycerus* Geoffroy, 1762 (Coleoptera: Lucanidae: Lucaninae) from Sichuan, China

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Abstract: A new species of the genus *Platycerus* belonging to the *P. bashanicus* species group is described from Erlang Mountain of Sichuan, Southwest China, under the name *P. minor* **sp. nov.** Diagnostic characters from the related species *P. diluvialis* Imura, 2012 and *P. xiongmao* Imura, 2008 are also provided.

Keywords: morphology, Platycerini, stag beetle, taxonomy

中国四川琉璃锹属一新种记述（鞘翅目：锹甲科：锹甲亚科）

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摘要：本文描述了采自中国西南部四川省二郎山的一种隶属于巴山琉璃锹种组的琉璃锹属新物种，命名为秀颚琉璃锹 *P. minor* **sp. nov.**。文中展示了该新种与近缘物种洪坝琉璃锹 *P. diluvialis* Imura, 2012 和熊猫琉璃锹 *P. xiongmao* Imura, 2008 的鉴别特征对比。

关键词：形态学，琉璃锹族，锹甲，分类学

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Introduction

The stag beetle genus *Platycerus* Geoffroy, 1762 is widely distributed in the Palearctic region, with the Chinese fauna exhibiting the highest diversity, comprising 30 species (excluding subspecies) (Huang & Chen 2009, 2017, 2022; Huang *et al.* 2010; Imura 2010a, 2011, 2012a; Kubota *et al.* 2018). The species of *Platycerus* from China have been divided into seven species groups based on morphological characters (Imura 2010a), namely the *P. bashanicus* species group, *P. businskyi* species group, *P. dundai* species group, *P. hongwonpyoi* species group, *P. kitawakii* species group, *P. tieguanzi* species group, and *P. turnai* species group. In particular, all members of the *bashanicus* species group have the following characters. In males: (1) head small; (2) mandible short with smoothly curved outer margin; (3) basal dorsal tooth with approximately parallel upper and lower outer margin; (4) flagellum long; (5) 1st, 2nd and 3rd paraflagellar lobe developed; (6) apical lobe bilaterally separated. In females: (1) hemisternite slender and elongated without concave at the apex; (2) stylus relatively long.

To date, three species belonging to the *P. bashanicus* species group have been recorded from Sichuan, China: *P. consimilis* Tanikado & Tabana, 1998, *P. diluvialis* Imura, 2012, *P. xiongmao* Imura, 2008 (Imura 2008b, 2012a; Tanikado & Tabana 1998). During recent field work, we found an unknown *Platycerus* species from the Mount Erlang, Tianquan County, Ya'an. Based on morphological characters, see the remark of *P. minor*, we consider this species as a member of the *P. bashanicus* species group, and it is closely related to *P. diluvialis* and *P. xiongmao*. However this species is quite different from *P. consimilis* by having (1) small gap between subapical ventral teeth; (2) basal dorsal teeth and small basal median lobe in males.

In this paper, we describe it as a new species, *P. minor* **sp. nov.**, and discuss its morphological differences with related species.

Material and methods

Fresh specimens were used for anatomical examination. Fresh male genitalia were prepared by injecting air inward through the opening of the basal piece and following by drying and curing. Fresh female genitalia were prepared by injecting liquid UV-curable adhesive inward through the opening of sternite I and followed by UV irradiation to cure the adhesive and thereby set the final form. Then examined under a stereomicroscope. Habitus images were captured using a Sony ILCE-7CII camera equipped with a Laowa FF 100 mm f/2.8L Macro 2:1 Lens. Images of morphological details were taken with a Laowa 25 mm f2.8 2.5-5× Ultra Macro Lens. Two CN-T96 LEDs were serving as the light sources during imaging. Image stacking was performed with Helicon Focus v. 6.7.1. All images were edited and compiled into plates using Adobe Photoshop CC 2019. The distribution map was prepared by QGIS 3.40.5 and edited in Adobe Photoshop CC 2019.

Specimens examined in this study are deposited in the following collections:

CKXJ—Private Collection of Kai-Xiang Jing, Chengdu;

CYFW—Private Collection of Yi-Fan Wang, Suzhou;

CYZH—Private Collection of Yu-Zhou Huang, Changsha;

CZHZ—Private Collection of Zhi-Hong Zhan, Nanjing;

IZCAS—Institute of Zoology, Chinese Academy of Sciences, Beijing.

Morphological terminology follows Imura (2010a).

Taxonomy

Family Lucanidae Latreille, 1804

Subfamily Lucaninae Latreille, 1804

Genus *Platycerus* Geoffroy, 1762

Checklist for species of *Platycerus bashanicus* species group

Platycerus auriceps Kubota & Zhu, 2018	China: Shaanxi
Platycerus bashanicus Imura & Tanikado, 1998	China: Chongqing
Platycerus canae Imura, 2010	China: Henan
Platycerus consimilis Tanikado & Tabana, 1998	China: Sichuan
Platycerus consimilis phagophilus Imura, 2005	China: Sichuan
Platycerus diluvialis Imura, 2012	China: Sichuan
Platycerus minor Jing, Wang & Huang **sp. nov.**	China: Sichuan
Platycerus nagahatai Imura, 2008	China: Shaanxi
Platycerus xiongmao Imura, 2008	China: Sichuan
Platycerus yeren Imura, 2008	China: Hubei

Platycerus minor Jing, Wang & Huang, sp. nov. 秀颚琉璃锹

https://zoobank.org/35E14746-2F56-4E24-AB39-1F9325F0A47E

Figs 1A, C; 2A–B; 3A, D; 4

Type material. Holotype: ♂, CHINA: Sichuan, Ya'an, Tianquan County, the southeastern bank of Longdan Stream [龙胆溪], 2000 m, 6.XII.2025, leg. Kai-Xiang Jing (IZCAS). **Paratypes:** 16♂18♀, same as holotype (CKXJ); 2♂2♀, same as holotype (CYFW); 1♂1♀, same as holotype (CYZH); 1♂1♀, same as holotype (CZHZ).

Description. Male (Figs 1A, C; 2A; 3A, D; 4A–E). Body length 9.1–10.5 mm. Body generally rose gold; dorsal surface rather coarsely scattered punctures; venter brownish black with a faint blue-greenish metallic lustre, covered with pubescence.

Head (Figs 1A, C; 2A; 3A) as in the other members of the genus; mandible relatively short, about 0.064–0.068 times as long as body length, tapers from base to apex and overall shape approximately one-quarter circular; ventral surface with two to four subapical ventral teeth, continuous from apex to basal 2/5, and with a gap between subapical ventral teeth and basal dorsal teeth; two basal dorsal teeth. Antennae geniculate, antennal club with four antennomeres, longer than antennomere I.

Pronotum transverse, much wider than head, about 1.4 times as wide as long, widest at approximately the basal 2/5, almost straight before and curved slightly outward after the widest of pronotum.

Legs (Figs 1A, C; 2A). Femur orange-yellow except at both ends; tibia dark bronze, protibia with two large teeth and serried denticles along outer margin, meso- and metatibia with no tooth; tarsus black.

Elytra elongate, about 1.8 times as long as wide.

Male genital organ viewed ventrally (Fig. 4A), lateral side of each paramere rather strongly inflated in basal portion, inner-apical angle effaced, inner margin nearly straight and emarginated near the base, inner-basal angle protrudent inwards, apical margin of basal piece roundly protruded apicad; viewed dorsally (Fig. 4C), 1st paraflagellar lobe with hemispherical protrusions on the outer side, 2nd paraflagellar lobe less swollen than 1st paraflagellar lobe, 3rd paraflagellar lobe larger and swollen than other two paraflagellar lobe with its bottom presents an outward-expanding pointed corner shape, flagellum is relatively long, basal median lobe protrude small; apical part viewed dorsally (Fig. 4D), pleats-like area underdeveloped, apical lobes converge forward.

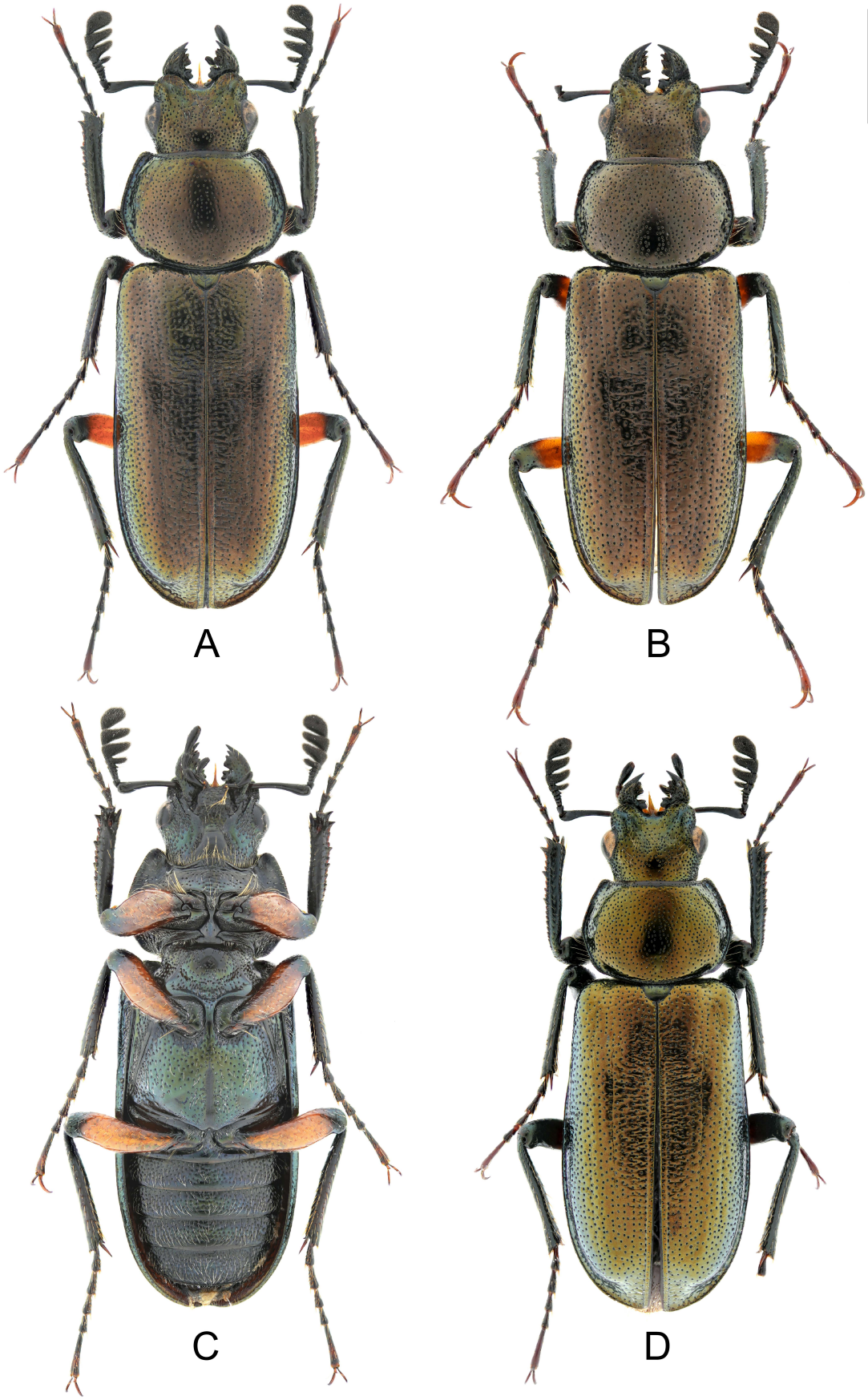

FIGURE 1. Habitus of *Platycerus* spp.: **A, C** *P. minor* **sp. nov.**, ♂, holotype **B** *P. xiongmao* Imura, 2008, ♂ **D** *P. diluvialis* Imura, 2012, ♂. Scale bar: 2 mm.

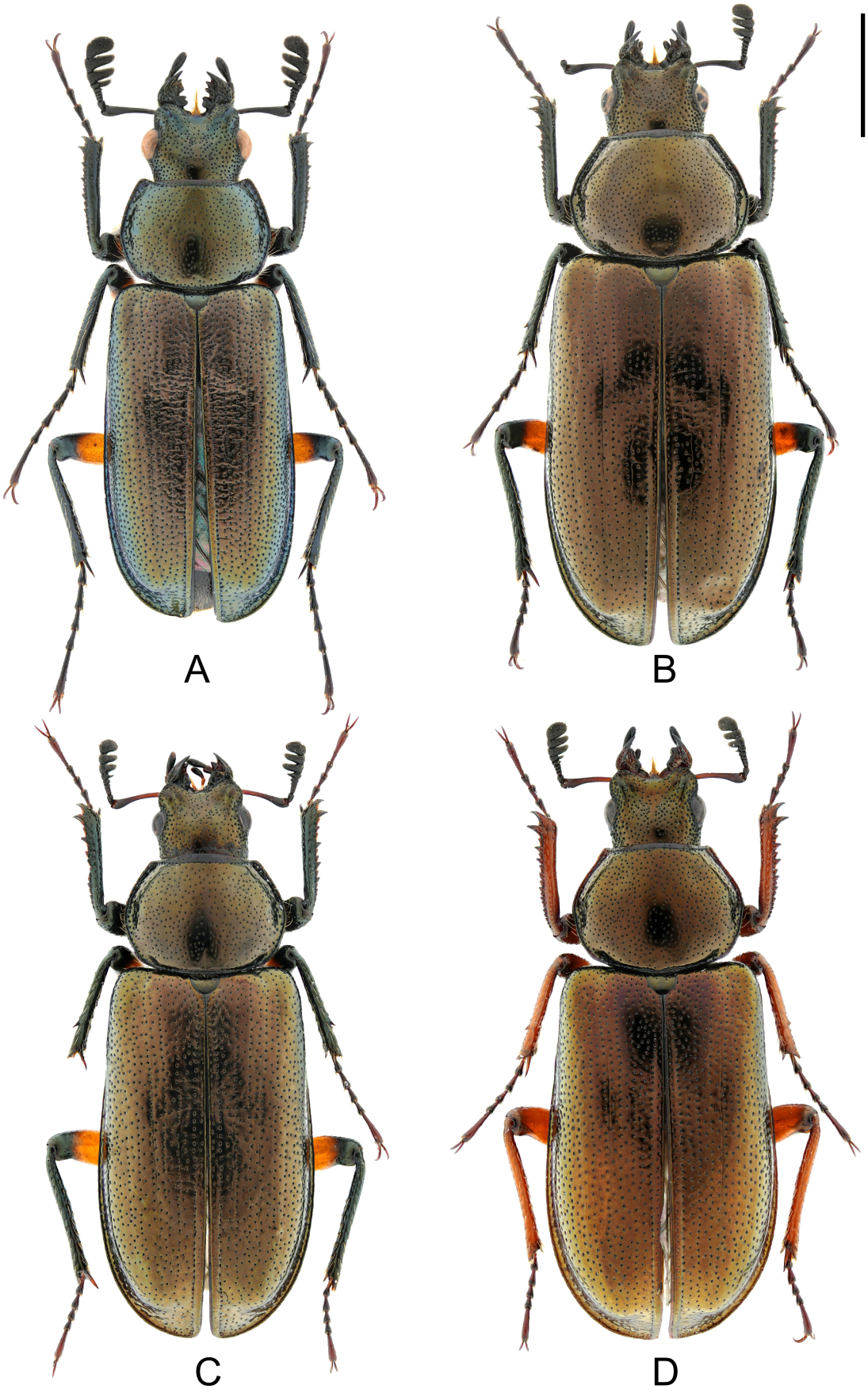

FIGURE 2. Habitus of *Platycerus* spp.: **A** *P. minor* **sp. nov.**, ♂, paratype **B** ditto, ♀, paratype **C** *P. xiongmao* Imura, 2008, ♀ **D** *P. diluvialis* Imura, 2012, ♀. Scale bar: 2 mm.

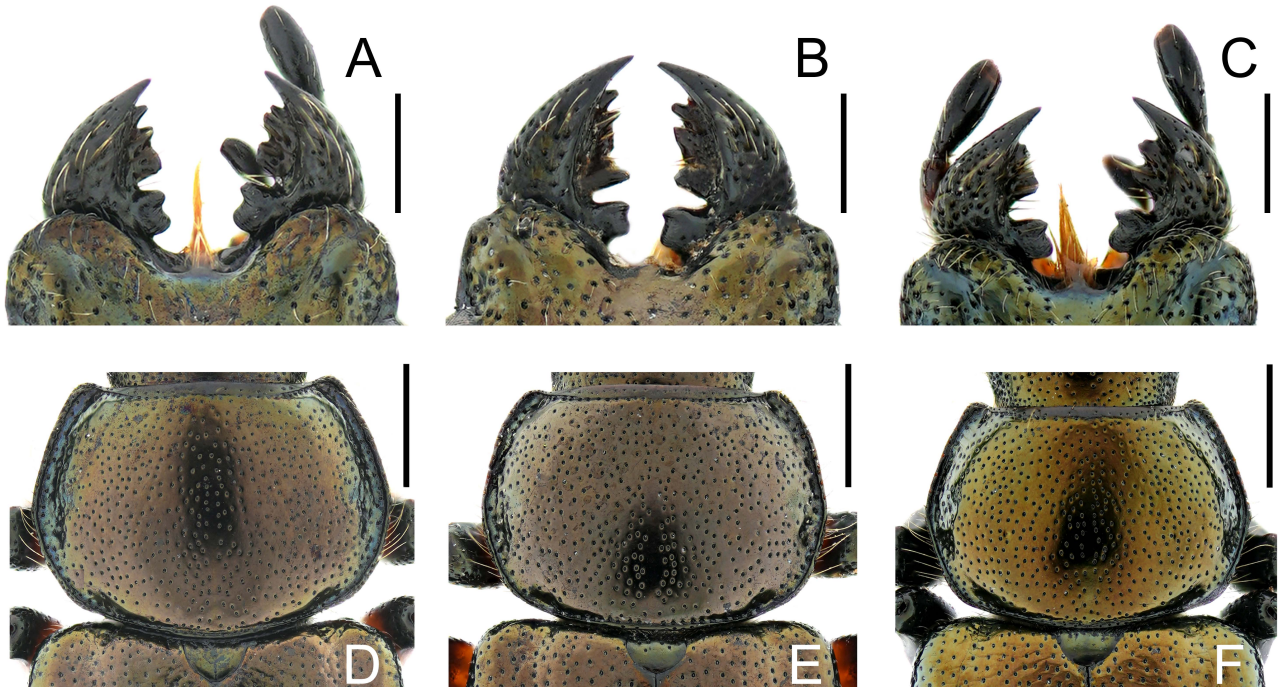

FIGURE 3. External characters of *Platycerus* spp.: **A, C** *P. minor* **sp. nov.**, ♂, holotype **B, D** *P. xiongmao* Imura, 2008, ♂ **C, F** *P. diluvialis* Imura, 2012, ♂; **A–C** mandibles, dorsal view **D–F** pronotum, dorsal view. Scale bars: 0.5 mm (A–C), 1 mm (D–F).

Female (Figs 2B, 4F–G). Body length 9.2–10.7 mm. Body above rose gold, which dorsal surface rather coarsely scattered punctures; venter brownish black with a faint blue-greenish metallic lustre but abdominal sternites redder than that of male, covered with pubescence.

Head smaller than in male, almost as in the other members of the genus; mandible small and short.

Pronotum about 1.4 times as wide as long, resembles the male in form, but with a narrower apex and base.

Legs similar to the male.

Elytra elongate, about 1.7 times as long as wide.

Female genital organ: vagina in fully everted condition relatively long and abruptly constricts at the middle (Fig. 4F), hemisternite subquadrate and robust, widest at the base, with relatively long stylus and the inner margin obviously emarginate (Fig. 4G).

Diagnosis. This new species exhibit similar morphological features with *P. xiongmao* but can be distinguished by the following characters: (1) mandible of males shorter and with a shallower gap between subapical ventral teeth and basal dorsal teeth (Figs 3A–B); (2) subapical ventral teeth relatively narrower (Figs 3A–B); (3) two basal dorsal teeth of males wider and more fused (Figs 3A–B); (4) in males, front angle of pronotum oriented more anteriorly (Figs 3D–E); (5) mandible of females with outer margin more curved (Figs 2B–C); (6) 2nd paraflagellar lobe more compressed (Figs 4B–C, E; 5B–C, E); (7) pair of 3rd paraflagellar lobes larger and splayed apart wider (Figs 4B–E; 5B–E); (8) hemisternite shorter and wider (Figs 4G; 5G).

This new species can be distinguished from *P. diluvialis* by the following combination of characters: (1) dorsal surface of males darker and duller (Figs 1A, D); (2) femur of males exhibits orange-yellow instead of dark brown (Figs 1A, C–D); (3) mandible of males with a shallower and narrower gap between subapical ventral teeth and basal dorsal teeth (Figs 3A, C); (4) mandible of females shorter (Figs 2B, D); (5) 2nd paraflagellar lobe more compressed (Figs 4B–C, E; 6B–C, E); (6) pair of 3rd paraflagellar lobes larger and splayed apart wider (Figs 4B–E; 6B–E); (7) apices of pair of apical lobes closer (Figs 4D; 6D); (7) hemisternite shorter and wider (Figs 4G; 6G).

Distribution. China (Sichuan) (Fig. 8).

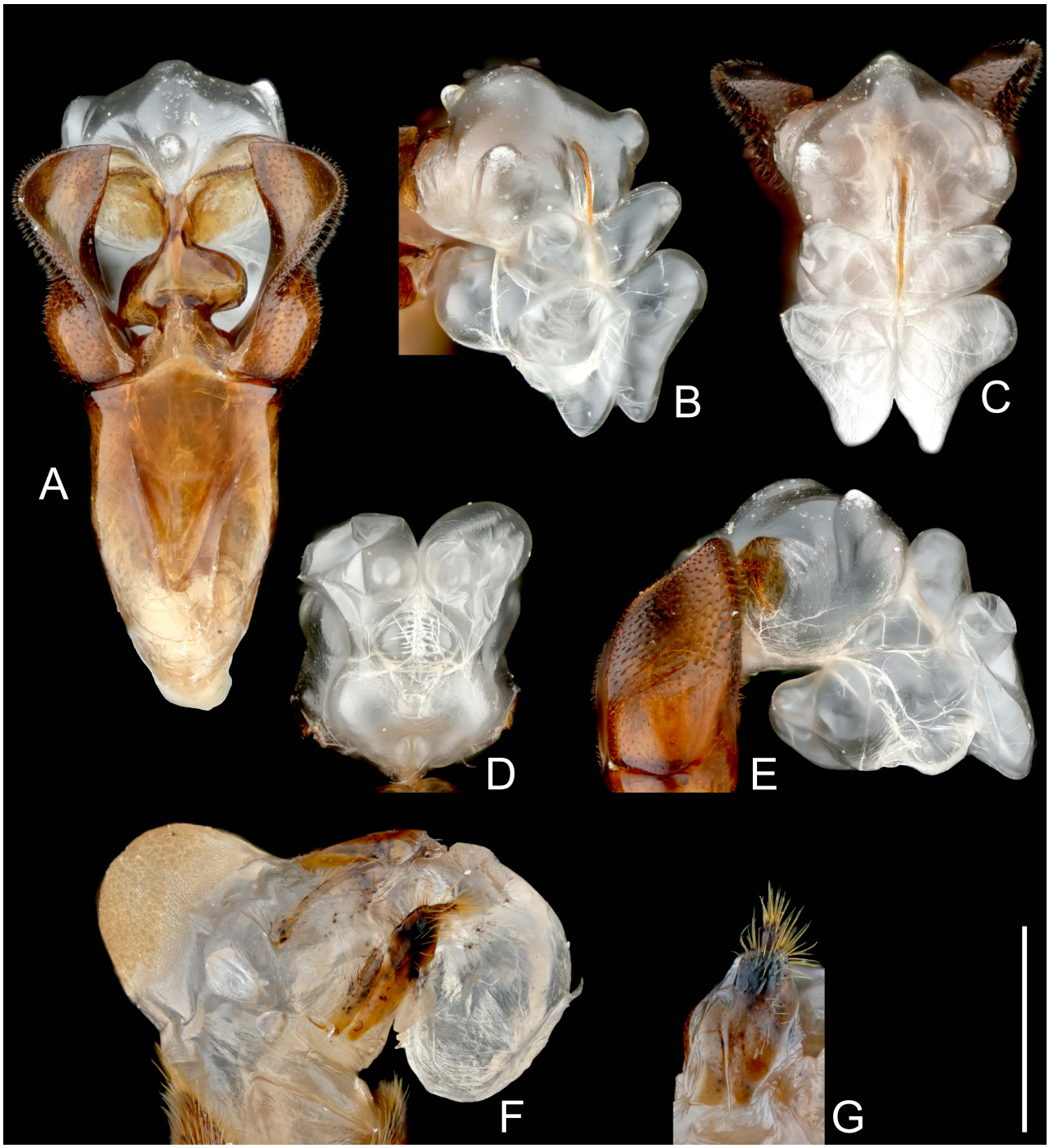

FIGURE 4. Genital organ of *Platycerus minor* **sp. nov.**: **A** aedeagus **B** penis with fully inflated internal sac, right subdorsal view **C** ditto, dorsal view **D** ditto (apical part), dorsal view **E** ditto (with right paramere), right lateral view **F** genital segment with everted vagina, left lateral view **G** left hemisternite, ventral view; **A–E** ♂, holotype (body length 9.9 mm) **F–G** ♀, paratype (body length 10.0 mm). Scale bar: 1 mm.

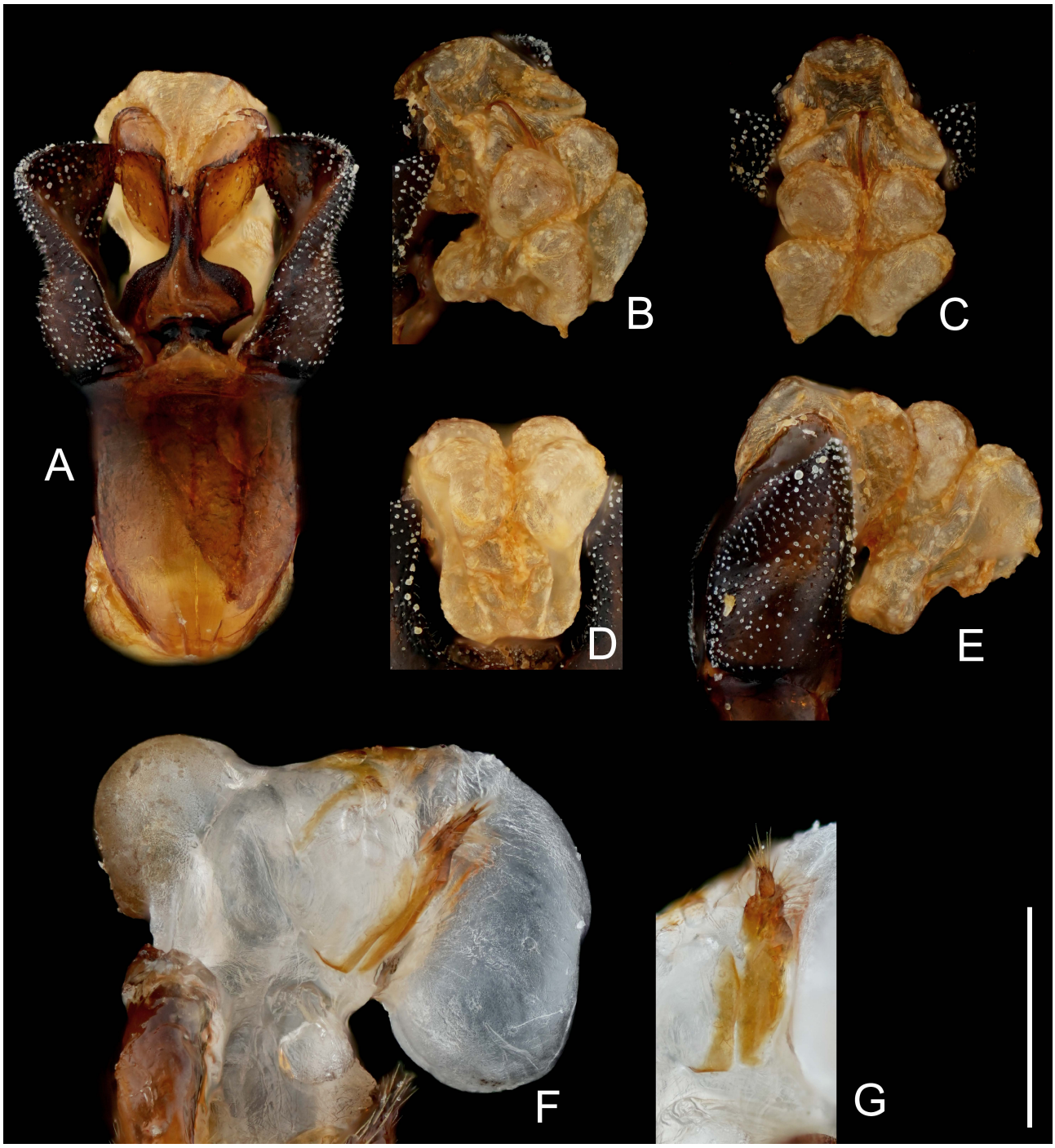

FIGURE 5. Genital organ of *Platycerus xiongmao* Imura, 2008: **A** aedeagus **B** penis with fully inflated internal sac, right subdorsal view **C** ditto, dorsal view **D** ditto (apical part), dorsal view **E** ditto (with right paramere), right lateral view **F** genital segment with everted vagina, left lateral view **G** left hemisternite, ventral view; **A–E** ♂ (body length 9.7 mm) **F–G** ♀ (body length 9.5 mm). Scale bar: 1 mm.

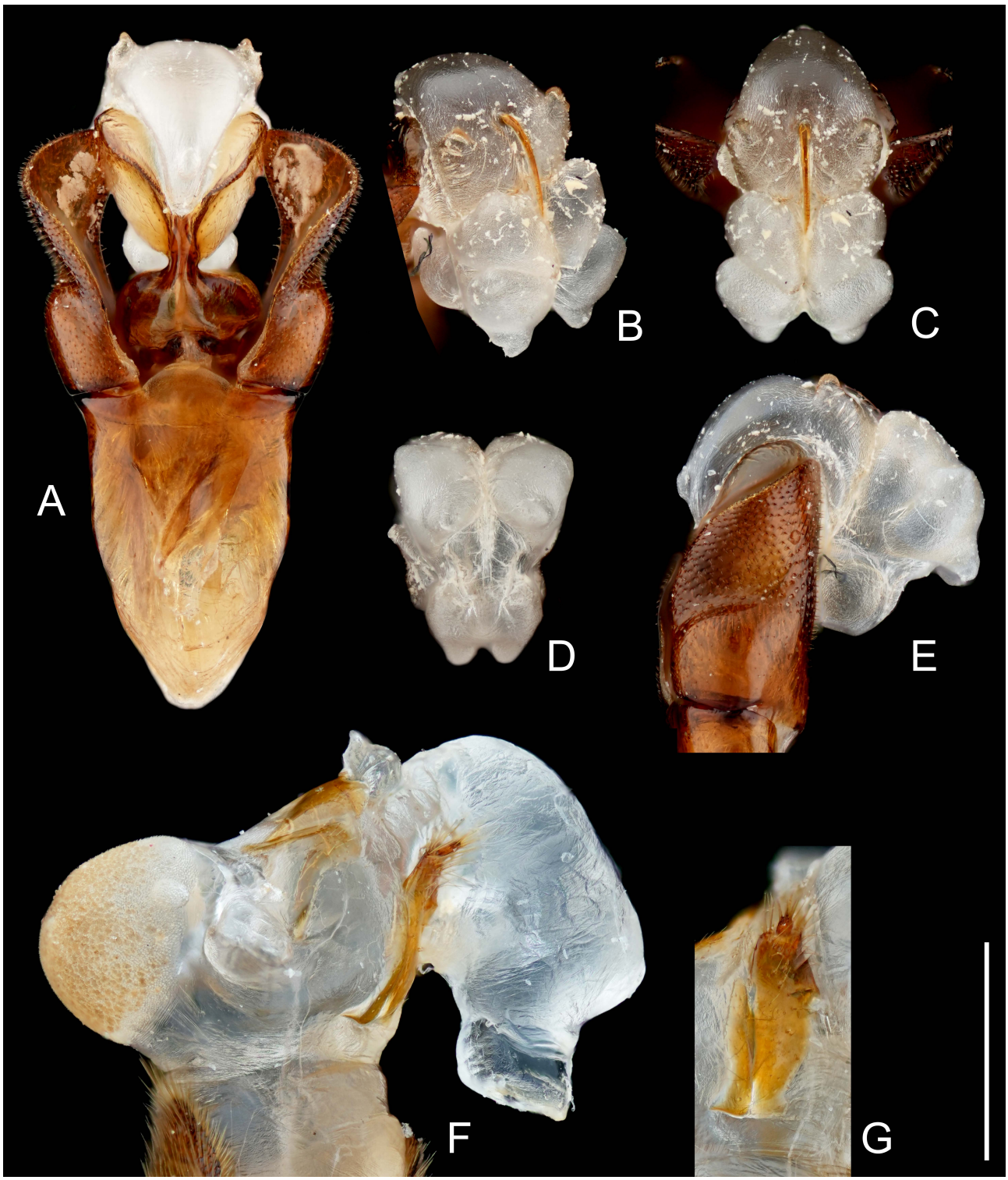

FIGURE 6. Genital organ of *Platycerus diluvialis* Imura, 2012: **A** aedeagus **B** penis with fully inflated internal sac, right subdorsal view **C** ditto, dorsal view **D** ditto (apical part), dorsal view **E** ditto (with right paramere), right lateral view **F** genital segment with everted vagina, left lateral view **G** left hemisternite, ventral view; **A–E** ♂ (body length 9.4 mm) **F–G** ♀(body length 9.9 mm). Scale bar: 1 mm.

Etymology. The species name is a Latin adjective "*minor*", referring its small size and delicate mandibles.

Biology and ecology. All the known specimens of this species were collected in the wet broadleaved forest on the slope at the southern part of Mount Erlang [二郎山] (Fig. 7A–B).

Remarks. The new species belongs to the *P. bashanicus* species group, diagnosed by male characters (Figs 1A, C; 2A; 3A; 4B–E).

P. minor **sp. nov.** is sympatric with *P. ladyae* Imura, 2005 onMount Erlang, where both species occur at similar elevations (approximately 2000 m). However, the outer margin of the male *P. ladyae* mandible constricts from middle to base.

Platycerus xiongmao Imura, 2008 熊猫琉璃锹

Figs 1B; 2C; 3B, E; 5

Platycerus xiongmao Imura, 2008b: 292 [type locality: Liangshuijing, Baoxing County, Ya'an, Sichuan, China], Figs 1, 2, 4; Zhu X-J *et al.*, 2020: 584 [specimens from Sanjiazhai, Ya'an, Sichuan, China].

Material examined. 1♂, CHINA: Sichuan, Ya'an, Baoxing County, Sanjiazhai [三家寨], 2360 m, 12.II.2021, leg. Kai-Xiang Jing (CKXJ); 2♀, CHINA: Sichuan, Ya'an, Baoxing County, Sanjiazhai [三家寨], 2370 m, 29.XI.2025, leg. Kai-Xiang Jing (CKXJ).

Distribution. China (Sichuan) (Fig. 8).

Biology and ecology. All the known specimens of this species were collected in the slightly dry broadleaved forest narrowly remaining on the southeastern slope of Mount Jiajin [夹金山] (Fig. 7C–D).

Remarks. The major male (Figs 1B; 3B; 5B–E) of this species is similar to *Platycerus minor* **sp. nov.**. For the differences, see the diagnosis of *P. minor* **sp. nov.** provided above.

During field investigations at Sanjiazhai [三家寨], no sympatric *Platycerus* species has been found. But at Qingyijiangyuan [青衣江源] (2700 m), 10 km northeast of Sanjiazhai [三家寨] and Shenmulei [神木垒] (2600 m), 8.7 km southwest of Sanjiazhai [三家寨], several specimens of *P. tangi* Imura, 2008, which belong to the *P. tieguanzi* species group (Imura 2010a), were collected without any discovery of this species.

Platycerus diluvialis Imura, 2012 洪坝琉璃锹

Figs 1D; 2D; 3C, F; 6

Platycerus diluvialis Imura, 2012a: 65 [type locality: Hongba Nature Reserve, Jiulong County, Ganzi, Sichuan, China], Figs 1–17.

Material examined. 1♂2♀, CHINA: Sichuan, Ganzi, Jiulong County, Hongba Township, Xiekou [斜口], 2230 m, 3.X.2025, leg. Kai-Xiang Jing (CKXJ).

Distribution. China (Sichuan) (Fig. 8).

Biology and ecology. All the known specimens of this species were collected in the moist broadleaved forest on the southern slope of Minya Konka [贡嘎山] (Fig. 7E–F).

Remarks. The major male (Figs 1D; 3C; 6B–E) of this species is similar to *Platycerus minor* **sp. nov.**. For the differences, see the diagnosis of *P. minor* **sp. nov.** provided above.

The adults in our figures were collected from the same piece of small decayed wood. Our female specimen (Fig. 2D; 6F–G) exhibits the following differences from the specimen described in the original publication of the species (Imura 2012a: Figs 4–7, 16–17): (1) outer margin smooth and almost straight before the widest of pronotum instead of rough and curved outward; (2) antenna longer; (3) hemisternite more slender and elongated without concave at the apex. The aforementioned characteristics are consistent with members of the *P. bashanicus* species group. In the contrast, the female specimen described by Imura (2012a) has hemisternite related to *P. ladyae*, which differs from all other members of the *P. bashanicus* species group, and the outer margin of the mandible is rounded and the outer margin of pronotum is rough which is inconsistent with *P. ladyae*. Therefore, we consider it to be either an atypical morphological variant of *P. ladyae*, or a potentially new, undescribed species. Further investigation is required to determine its exact taxonomic status.

FIGURE 7. Habitats of *Platycerus* spp.: **A** Habitat of *P. minor* **sp. nov.** in Erlang Mountain, Ya'an **B** larvae of *P. minor* **sp. nov. C** Habitat of *P. xiongmao* Imura, 2008 in Sanjiazhai, Ya'an **D** larva of *P. xiongmao* **E** Habitat of *P. diluvialis* Imura, 2012 in Hongba Township, Ganzi **F** larva of *P. diluvialis*.

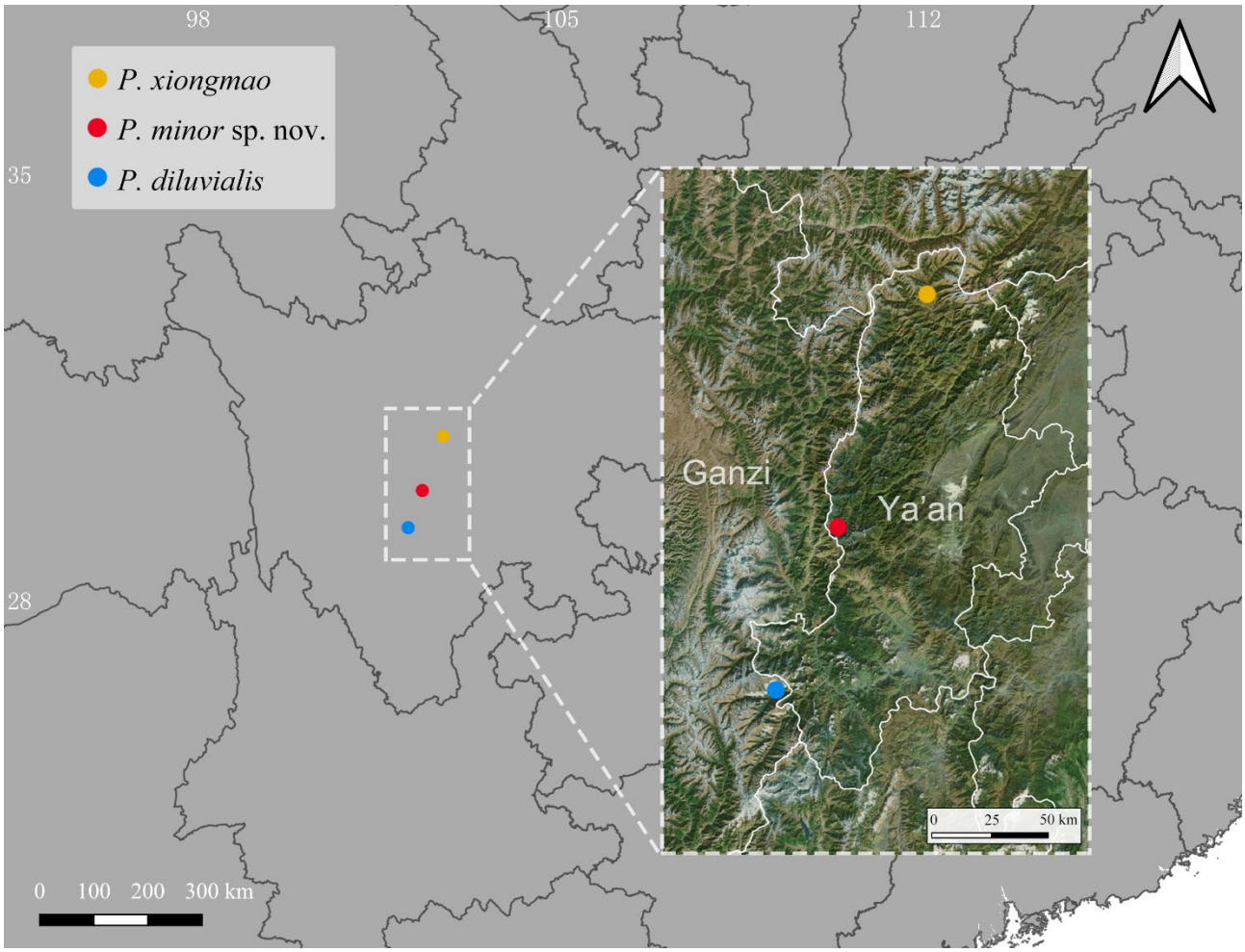

FIGURE 8. Distribution map of *Platycerus minor* **sp. nov.** and its related species.

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Additional information

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Photo Gallery

Leptodirus hochenwarti reticulatus Müller, 1904
photograph by Han-Yang Xue [薛翰阳]